Part III. Summary of Minimum Control Measures

1. Public Education and Outreach

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
1	Create a Stormwater Program	Department of Public Works Planning Board Conservation Commission Board of Health Board of Selectmen	Millbury will present its Comprehensive Stormwater Management Program to the public at a public meeting.	The Town of Millbury has completed *Stormwater Management Phase II Assessment* report. Copies are available for review by town departments and the public. The Stormwater Management Program and IDDE were discussed at a Board of Selectmen meeting March 9, 2004. The Town of Millbury held a multi-department stormwater work session to review goals and responsibilities of the Comprehensive Stormwater Management program in May 2004.	Measurable Goal complete. No additional goals are required after year 1.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
2	Create a Stormwater Program	Department of Public Works	Millbury will identify appropriate sources of funding assistance (SRF, 319 Grant Program, 604(b) Grant Program, Lakes & Ponds Grant Program, Source Water Protection Grant Program, Recycling Grant Program) and apply for assistance in implementing portions of its Comprehensive Stormwater Management Program, including public education and outreach.	During year 1 The Town of Millbury identified and was awarded grant assistance from DEP's 319 Nonpoint Source Pollution Grant Program and SRF. The 319 Grant will assist with drainage at Dorothy Pond. Millbury was also approved for SRF loan assistance to develop a Comprehensive Stormwater Management Plan and to implement the components of the IDDE program. This program has been funded and is underway.	The Town of Millbury will continue to identify funding opportunities and implement the 319 grant and SRF loan programs to support the protection of local water bodies. The Dorothy Pond BMP specifications are in the final stages of approval and getting ready to bid the work. The IDDE program is underway.

1. Public Education and Outreach (cont'd)

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
3	Address specific groups	Department of Public Works	Distribute EPA and other relevant educational brochures to targeted audiences. Distribution points include Town Hall, Library, and Transfer Station.	The Town of Millbury has a disk containing EPA educational materials that can be printed and distributed. Information available from the Town includes "Transfer Station Regulations." The Millbury High School (in conjunction with the Environmental Council) makes annual environmental education presentations to the third grade classes. The third graders were given "earth bags" of environmental information. The Town has printed brochures and is making them available at town buildings.	The Town will continue to print and make available brochures regarding stormwater. The Town set up an educational stormwater display at town meeting in May 2005.
4	Target groups likely to impact storm water	Department of Public Works	Brochures targeting specific audiences and activities will be available. These target groups include homeowner and lawn maintenance activities, disposal of household waste, and pet maintenance.	See BMP #3.	See BMP #3.

1. Public Education and Outreach (cont'd)

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
5	Identify alternative information sources	Department of Public Works MIS Department	Millbury will post links to stormwater BMPs and other water quality education resources, including EPA and DEP on its website. http://www.millbury-ma.org/ Millbury will post links to Our Lady of Assumption School student storm drain project. www.sdwgt.tripod.com / Town will work with Lake Singletary Watershed Association in the collection and dissemination of data from the Association's 8-year sampling program. Data will be posted on town website along with relevant BMPs for target audiences.	The Town does not have a website manager. This BMP was not completed for Permit Year 2. The Towns consultant identified multiple relevant web links to be linked to the Town website.	The Town of Millbury will consider posting BMPs, the EPA, DEP links, and student storm drain links on its website. The Our Lady of Assumption School website is not currently active, but attempts will be made to restart the site. The Town will make efforts to post the links in year 3.
6	Identify alternative information sources	Department of Public Works MIS Department	The Town of Millbury will contact the Blackstone River Watershed Council to review opportunities in Millbury. These opportunities include hosting a watershed association meeting in Millbury with notice on website and local access channel, and televising a meeting reviewing watershed activities or needs specific to Millbury.	The Town of Millbury is in the process of identifying a liaison to the Blackstone River Watershed Council (BRWC).	The Town of Millbury will contact the Blackstone River Watershed Council to determine opportunities within Millbury. Town of Millbury will continue to coordinate with the Lake Singletary Watershed Association and support their programs. The Town of Millbury will identify the liaison to the BRWC.

1. Public Education and Outreach (cont'd)

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
7	Utilize local public access channel	Department of Public Works	Public meeting notice and a meeting reviewing Millbury's Comprehensive Stormwater Management Program will be posted/broadcast on Millbury's local access channel.	Goal complete year 1. The IDDE was reviewed on local access in March 9, 2004 Board of Selectmen meeting.	Local access will continue to announce stormwater related public announcements.
8	Develop, conduct and document educational programs	Department of Public Works Selectmen Liaison	The Town of Millbury will contact the Blackstone River Watershed Council to review opportunities in Millbury. These opportunities include hosting a watershed association meeting in Millbury with notice on website and local access channel, and televising a meeting reviewing watershed activities or needs specific to Millbury. The Dorothy Pond Restoration Committee and the Ponds and Lakes Commission (appointed by the Town) will post meeting and event notices on the Town of Millbury's web page. Special events and seminars with guest speakers will be televised on Millbury's local access channel.	The Town of Millbury Board of Selectmen minutes include discussion of the 319 grant. These minutes were uploaded on the Town website during year 1. The Town website includes a link of contact information and meeting notices for the Dorothy Pond Restoration Committee. The Our Lady of Assumption School works with the Blackstone River Watershed Council and Massachusetts Audubon Society for environmental education programming regarding stormwater. The Dorothy Pond Association and Lake Singultary Association have printed and distributed brochures and flyers to residents hat live within the waterbody residential areas including Millbury and Sutton.	Millbury will consider hosting a Blackstone River Watershed meeting and post notices on the website and local cable access. Millbury will also continue to maintain and add to the Town website. The Our Lady of Assumption School programming is expected to continue.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
9	Promote Household Waste Recycling	Department of Public Works Board of Health	The Town of Millbury will work with its contracted waste hauler and the Board of Health to continue to sponsor Hazardous Waste Collection Days.	The Town of Millbury has transfer station regulations available at the Town Clerk's office. The High School Environmental Council supports recycling education in the school system.	These recycling programs are expected to continue.

2. Public Involvement and Participation

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
10	Storm drain stenciling	Department of Public Works	Millbury will work with local students at Our Lady of Assumption School in continuing its support of storm drain stenciling by students.	The Our Lady of Assumption School provided storm drain stenciling services for the Town during Permit Year 2.	The Our Lady of Assumption School will be providing storm drain stenciling services during May of Permit Year 3.
11	Community clean-ups	Department of Public Works Millbury Conservation Commission	Town of Millbury will encourage local stream team cleanups with local residents and area Scout groups. Town will provide solicitation of sponsors and notice of events on local access channel and website.	The Environmental Council at Millbury High School has coordinated a stream team event program. Information regarding the council can be found on the Environmental Council web-site at: http://www.millbury.k12.ma.us/hs/ec/main.htm The latest event was held October 5, 2004 around Brierly Pond. The Our Lady of Assumption School 7th graders performed a river cleanup during Permit Year 2. The 2005 Earth day cleanup was aided by DPW.	The stream team cleanups with both schools are expected to continue annually.
12	Community clean-ups	Department of Public Works	Town will provide trucks and other material to support cleanup efforts and disposal of materials.	The Town of Millbury provides trucks for disposal of trash during stream team events.	The Town of Millbury is expected to continue supporting stream team clean ups.

3. Illicit Discharge Detection and Elimination

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
13	Inventory and mapping of storm drain system	Department of Public Works	Millbury will identify appropriate sources of funding assistance (SRF, 319 Grant Program, 604(b) Grant Program, Lakes & Ponds Grant Program, Source Water Protection Grant Program, Recycling Grant Program) and apply for assistance in implementing portions of its Comprehensive Stormwater Management Program, including public education and outreach.	The Town of Millbury applied and was approved for an SRF loan for funding of the IDDE. Components of the program include: o GIS Basemap, o Mapping entire stormwater system including tracing application and modeling, o Outfall inspection and inventory, o Bacterial sampling of outfalls, o Education on the hazards of illegal dumping, and o Bylaw review. The Town of Millbury received local approval for the IDDE.	The CSMP is now underway.
14	Mapping and identification of outfalls and receiving waters	Department of Public Works Board of Assessors	Millbury will develop and implement a plan to map all outfalls and receiving bodies of water, contingent on Town Meeting approval of funding.	This BMP was dependant on Town Meeting approval of the IDDE. The IDDE program was approved and is in progress. The aerial flyover for mapping receiving water bodies and outfalls is complete.	Mapping of the outfalls and receiving water bodies will continue.

3. Illicit Discharge Detection and Elimination (cont'd)

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
15	Identification/description of problem areas	Department of Public Works	Millbury will develop and implement an Illicit Discharge Detection and Elimination (IDDE) plan, contingent on Town Meeting approval of funding.	The IDDE program is in process. The Towns consultant is preparing a draft report on Identification of Potential Illicit Discharge Areas.	Complete the report on Identification of Potential Illicit Discharge Areas.
16	Enforcement procedures addressing illicit discharges	Planning Board Town Counsel Board of Health	Millbury will review whether local authority is appropriate and able to respond to potential illicit discharges. New by-laws, if necessary, will be proposed to Town Meeting.	This BMP was not scheduled for Permit Year 2.	This BMP is scheduled for Permit Year 3. As part of the CSMP, Millbury will review whether local authority is appropriate and able to respond to potential illicit discharges. New by-laws, if necessary, will be proposed to Town Meeting.
17	Public information program regarding hazardous wastes and dumping	Department of Public Works Board of Health	Millbury will provide educational brochures to residents promoting proper disposal of household hazardous wastes and conditions for regional collections.	The Town is in possession of a CD with DEP educational brochures for reproduction. DEP flyers are distributed at the Town Hall, transfer station and the Highway Department.	Millbury will continue provide educational brochures to residents promoting proper disposal of household hazardous wastes and conditions for regional collections at the Town Hall, transfer station and the Highway Department.

3. Illicit Discharge Detection and Elimination (cont'd)

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
18	Initiation of recycling programs	Planning Board Board of Health	Millbury will apply for funding assistance from DEP's Recycling Grant Program for assistance in public education and the purchase of recycling materials.	Recycling information is located within the transfer station regulations available at the Town Clerk's office. The Town recycles glass, plastic, cans, and newspaper and magazines. Some Hazardous Wastes are collected and stored for proper disposal these wastes are car batteries and waste oil. The Town applied for the recycling grant but did not receive grant. The High School Environmental Council supports recycling education in the school system.	The Town of Millbury expects to continue the recycling program and apply for the recycling grant again.

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
19	Watershed assessments and studies	Department of Public Works Conservation Commission Board of Health	Millbury will identify opportunities for funding assistance from DEP's 604(b) and 319 grant programs and the Department of environmental Management's Lakes and Ponds Grant Program to support watershed assessment and implementation activities. Tasks may include design and installation of stormwater BMPs and public outreach including storm drain stenciling. Emphasis will be on assessments and remediation of stormwater related problems impacting water quality in Brierly Pond, Dorothy Pond, Hathaway Pond, Howe Pond, Howe Reservoirs, Slaughterhouse Pond, and Woolshop Pond. These waterbodies have been identified as impaired and on DEP's 303d list.	During year 1 Millbury applied for and received a 319 grant for Dorothy Pond stormwater remediation and SRF funding for the CSMP. No new applications for year 2.	The Town of Millbury will continue to identify funding opportunities and implement the 319 grant and SRF loan programs to support the protection of local water bodies.

3. Illicit Discharge Detection and Elimination (cont'd)

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
20	Watershed assessments and studies	Department of Public Works Public Water Suppliers	The Town of Millbury will encourage the Massachusetts American Water Works Co. to apply for funding assistance from DEP's Source Water Protection Program for grant assistance to develop wellhead protection plans and stormwater management plans within Zone IIs. These plans can include stormwater management programs. The proposed tasks will include a public education component. The Lake Singletary Watershed Association will be consulted and asked to provide educational data from their studies and monitoring of Lake Singletary for posting on Millbury's local access channel and website.	The Water Protection Program was unavailable during Permit Year 1. The Town applied for and received grants for wellhead protection to remove perchlorate from groundwater due to dynamite blasting. Filters system are being designed. The Lake Singultary Watershed Association is creating and distributing handouts to the residents of Lake Singultary in both Millbury and Sutton. The Town does not currently have a Web Manager.	The Town of Millbury will ascertain the availability of funds from the Water Protection Program in Permit Year 3. The Town of Millbury will contact the Lake Singletary Watershed Association regarding educational data from their studies and monitoring.

4. Construction Site Stormwater Runoff Control

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
21	Bylaw: Storm water management regulations for construction sites 1 acre or larger	Planning Board Conservation Commission Town Counsel Board of Health Zoning Board of Appeals	Millbury will review model by-law developed by DEP in consultation with the Attorney General's Office.	The Planning Board, Conservation Commission, and Board Of Health have been meeting on bylaws.	Meetings will continue to be scheduled with all departments to review the construction bylaws. The Towns consultant will assist in review of relevant model by-laws.

5. Post-Construction Stormwater Management in New Development and Redevelopment

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
22	Bylaw: Require post-construction runoff controls	Planning Board Conservation Commission Town Counsel Board of Health Zoning Board of Appeals	Millbury will review model by-law developed by DEP in consultation with the Attorney General's Office.	The Planning Board, Conservation Commission, and Board Of Health have been meeting on bylaws.	A meeting is to be scheduled with all departments to review the post-construction bylaws. The Towns consultant will assist in review of relevant model by-laws.

6. Pollution Prevention and Good Housekeeping in Municipal Operations

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 1 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 2
23	Develop a municipal Operations and Maintenance Plan	Department of Public Works	Using regulations and recommendations from DEP and EPA, Millbury will develop and update an operations and maintenance (O&M) plan to include proper disposal of street sweepings, catchbasin cleanout, snow disposal, roadway de-icing procedures, vehicle washing, and outside storage of materials.	The Town of Millbury has Stormwater Pollution Prevention Plans (SWPPP) for the highway facility, transfer station, and wastewater treatment facility. These plans contain stormwater BMPs, good housekeeping practices, and employee education. This is an ongoing program.	The Town of Millbury will continue to follow the O&M plans as described in the SWPPP documents.
24	Develop a municipal Operations and Maintenance Plan	Department of Public Works	Millbury will implement a formal inspection program, including maintenance logs and scheduling, for catchbasin cleaning, repairs, and new installation.	The DPW does keep some records of maintenance activities. A formal municipal O&M Plan will be developed with the contracted engineering company as part of the ongoing Comprehensive Stormwater Program.	The Town of Millbury will begin recording and documenting inspection and maintenance activities.
25	Develop and implement training programs for municipal employees	Department of Public Works	Millbury will send a minimum of 3 public works employees annually to training seminars sponsored by MassHighway, BayState Roads, and other relevant agencies or vendors.	The DPW sent 3 public works employees to the Baystate Roads training seminar.	Training has been allocated in the FY05 budget and the 3 employees will attend.

6. Pollution Prevention and Good Housekeeping in Municipal Operations (cont'd)

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 2 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 3
26	Review storm drainage infrastructure needs	Department of Public Works	Millbury will incorporate storm drain infrastructure review in its Chapter 90 project utilizations.	The Town of Millbury contracted engineering firm has designed the installation of Stormceptor units or other appropriate Stormwater BMPs along Dorothy Pond and Lake Singletary. Another drainage infrastructure project is the elimination of the junior/senior high school drainage problem. The engineering is complete.	The junior/senior high school drainage problem will be constructed. The Dorothy Pond Contract is being finalized and the work will be bid on and constructed.

7. BMPs for Meeting Total Maximum Daily Load (TMDL) Waste Load Allocations (WLA)- *NOT APPLICABLE*

BMP ID #	BMP Description	Responsible Dept./Person Name	Measurable Goal(s)	Progress on Goal(s) – Permit Year 1 (Reliance on non-municipal partners indicated, if any)	Planned Activities – Permit Year 2
				No TMDLs in the Town of Millbury	

7a. Additions

7b. WLA Assessment

Part IV. Summary of Information Collected and Analyzed

BMPs have not been installed. Sampling and analysis has not been performed.

Part V. Program Outputs & Accomplishments (OPTIONAL)

Programmatic

Stormwater management position created/staffed	(y/n)	
Annual program budget/expenditures	($)	

Education, Involvement, and Training

Estimated number of residents reached by education program(s)	(# or %)	
Stormwater management committee established	(y/n)	
Stream teams established or supported	(# or y/n)	
Shoreline clean-up participation or quantity of shoreline miles cleaned	(y/n or mi.)	
Household Hazardous Waste Collection Days		
▪ days sponsored	(#)	
▪ community participation	(%)	
▪ material collected	(tons or gal)	
School curricula implemented	(y/n)	

Legal/Regulatory

In Place

	Prior to Phase II	Under Review	Drafted	Adopted
Regulatory Mechanism Status (indicate with "X")				
▪ Illicit Discharge Detection & Elimination				
▪ Erosion & Sediment Control				
▪ Post-Development Stormwater Management				
Accompanying Regulation Status (indicate with "X")				
▪ Illicit Discharge Detection & Elimination				
▪ Erosion & Sediment Control				
▪ Post-Development Stormwater Management				

Mapping and Illicit Discharges

Outfall mapping complete	(%)	
Estimated or actual number of outfalls	(#)	
System-Wide mapping complete	(%)	
Mapping method(s)		
▪ Paper/Mylar	(%)	
▪ CADD	(%)	
▪ GIS	(%)	
Outfalls inspected/screened	(# or %)	
Illicit discharges identified	(#)	
Illicit connections removed	(#) (est. gpd)	
% of population on sewer	(%)	
% of population on septic systems	(%)	

Construction

Number of construction starts (>1-acre)	(#)	

Estimated percentage of construction starts adequately regulated for erosion and sediment control	(%)	
Site inspections completed	(# or %)	
Tickets/Stop work orders issued	(# or %)	
Fines collected	(# and $)	
Complaints/concerns received from public	(#)	

Post-Development Stormwater Management

Estimated percentage of development/redevelopment projects adequately regulated for post-construction stormwater control	(%)	
Site inspections completed	(# or %)	
Estimated volume of stormwater recharged	(gpy)	

Operations and Maintenance

Average frequency of catch basin cleaning (non-commercial/non-arterial streets)	(times/yr)	
Average frequency of catch basin cleaning (commercial/arterial or other critical streets)	(times/yr)	
Total number of structures cleaned	(#)	
Storm drain cleaned	(LF or mi.)	
Qty. of screenings/debris removed from storm sewer infrastructure	(lbs. or tons)	
Disposal or use of sweepings (landfill, POTW, compost, recycle for sand, beneficial use, etc.)		
Cost of screenings disposal	($)	

Average frequency of street sweeping (non-commercial/non-arterial streets)	(times/yr)	
Average frequency of street sweeping (commercial/arterial or other critical streets)	(times/yr)	
Qty. of sand/debris collected by sweeping	(lbs. or tons)	
Disposal of sweepings (landfill, POTW, compost, beneficial use, etc.)	(location)	

Cost of sweepings disposal	($)	
Vacuum street sweepers purchased/leased	(#)	
Vacuum street sweepers specified in contracts	(y/n)	

Reduction in application on public land of: ("N/A" = never used; "100%" = elimination)		
▪ Fertilizers	(lbs. or %)	
▪ Herbicides	(lbs. or %)	
▪ Pesticides	(lbs. or %)	

Anti-/De-Icing products and ratios	% NaCl % $CaCl_2$ % $MgCl_2$ % CMA % Kac % KCl % Sand	
Pre-wetting techniques utilized	(y/n)	
Manual control spreaders used	(y/n)	
Automatic or Zero-velocity spreaders used	(y/n)	
Estimated net reduction in typical year salt application	(lbs. or %)	
Salt pile(s) covered in storage shed(s)	(y/n)	
Storage shed(s) in design or under construction	(y/n)	

PHASE 1

1 SRF Application

1.1 SRF Application

Prepare SRF Application and compile information prepared by the town. The SRF application includes Parts I, II, and II, Authority to File, Certifying Authority to File, Local Appropriation, Professional Services Agreements, Cost Summary, Detailed Fee Breakdown, Subcontracts, MBE/WBE Requirements, Statement of MA Tax Compliance. Submit application to DEP.

Total Cost Phase I: $3,000.

PHASE 2

2 Pilot Area

2.1 Project Startup/Planning Coordination

Meet with Town officials to establish protocol, contacts, review existing information, develop schedules, and coordination of work with local police and fire departments. Prepare a project procedures manual outlining the project work plan, team members, and established protocols for the project.

2.2 SRF Administrative Costs and Project Management

On behalf of the town and in accordance with DEP requirements, GE&A will prepare monthly reports, reimbursement requests/payment vouchers forms, and attend monthly progress meetings necessary for administration of the Phase II Stormwater Management Plan and SRF Funding. A total of 18 monthly meetings and reports are included in this project. Reimbursement requests will be sent to the town for review and execution for submittal to the WPAT.

2.3 Base Map Acquisition and Pilot Project

The first component of the project will be to establish a new, accurate base map for the project. The base map will include new aerial photography, ground control, aerial triangulation, planimetric mapping, digital ortho photos, and a retrofit of the parcels to the new base map.

2.3.1 Aerial Photography

The first aspect of this will be to acquire new aerial photography of the town. Color aerial photographs at a scale of 1":300' will be acquired to serve as the basis for 1":40' ASPRS Class 1 planimetric and digital orthophoto mapping. The photography will be acquired this fall (November/December) time frame based on appropriate weather conditions for the flight. Airborne GPS and supplemental ground control will be collected for the project.

This data will be used as the basis for the remainder of the base-mapping component of the project.

2.3.2 Analytical Triangulation

The next step in the process will be to perform an analytical triangulation in order to transfer and densify ground control throughout the aerial photography. This triangulation will meet or exceed National Map Accuracy Standards for a 1"=40' scale map. A FAAT and control report will be provided which will list control values and contain a control diagram showing relational control point locations.

2.3.3 Pilot Project

The next step to take is to execute a Pilot Project of an area of Millbury that will consist of 4 to 6 contiguous map sheets.

The Pilot Project will allow Millbury staff the project team to test various conversion methodologies and check plot formats. During the Pilot, the important aspects of that particular project phase will be tested, evaluated and documented for use during the remaining tasks of the assignment. The following protocols will be developed and refined during the Pilot as appropriate:

- All aspects of the database design and layering conventions
- The design and development of data processing routines
- Creation and refinement of the Quality Control routines and methodologies
- The standards, marginalia and layout for the check and final plots
- Documentation of the conversion methodologies including the project deliverables and review schedule

The pilot will consist of all base-mapping components including planimetric mapping, digital orthophotos, and parcel mapping. Each of these is described further (for the whole project) in sections to follow.

2.3.4 Planimetric Mapping

Planimetric mapping will commence once the Ground Control and FAAT has been completed. All mapping will be compiled at a scale of 1"=40' in accordance with ASPRS Class 1 Accuracy Standards. The following table lists the features that will be captured:

Feature Description	Feature Type
BASIC PLANIMETRY	
Edge of Pavement	Polygon
Building Foot/Roof prints	Polygon
Bridges	Polygon
Sidewalks	Polygon
Trails	Line
Pads/Foundations	Line
Driveways	Polygon
Parking Lots	Polygon
Hydrography (streams, ponds, lakes, rivers)	Polygon/Line
Wet areas, Marshes, Swamps	Polygon
Street Centerlines	Line
Railroads	Line
UTILITY PLANIMETRY	
Manholes (drain, sewer, utility)	Points
Fire Hydrants	Points
Drainage features (dam, ditch, culvert, outfall, headwall, wingwall)	Line
Catch basins	Point
FULL PLANIMETRY	
Pavement Markings	Line
Fences	Line
Walls (at least 2 ft. high & 40 ft long)	Line
Vegetation (Over 1/4 acre)	Polygon
Docks and Piers	Polygon
Street Trees	Point
Street Furniture/Infrastructure	Point
Cemeteries	Polygon
Sports Facilities/Areas	Point

2.3.5 Digital Orthophotography

Each of the photographs taken of the town will be scanned at a resolution of one-pixel equals six inches on the ground surface. The digital version of these photographs will be rectified and corrected to the ground surface using the ground control and aerial triangulation from the previous steps and a mosaic will be created for the pilot area.

2.3.6 Deliverables for Base Mapping Pilot

- Color Aerial Flight for Town of Millbury at approximately 1"=320' scale
- Ground control and Aerial Triangulation
- Ground control report with point listing & point diagram; FAAT report with solution tables
- Planimetric Mapping for 4 to 6 contiguous tiles
- Paper check plots for comments; electronic data on CD-ROM
- Digital Orthophotography for 4 to 6 contiguous tiles
- MrSID ½ foot resolution digital orthophoto files on CD-ROM

2.4 Stormwater System Utility Automation Pilot

2.4.1 Collect and Inventory Sources Material

The first step in the process is to scan, inventory, and assess the source documents that are available to determine where we have sources, what the best source is, and where there are gaps. Each source is first inventoried as to what area it covers, and what sources are shown on the documents. The end result is a comprehensive inventory of all source documents.

We will come on site, collect the plans, and take them off site to be scanned. Each plan will be scanned and then returned to the Town. Once these plans have been scanned the inventory phase will begin. Each plan will be viewed, and the corresponding street centerline will be coded with the plan name. This process creates a spatial index of the plans and also allows identification of where there may be missing plans for each utility layer's automation.

After all plans have been inventoried, a town-wide map will be developed for each required utility system. A meeting will then be held with the Town staff to review these inventories with the goal of identifying additional plans that may be available to fill in the gaps that are found. Any additional plans identified will also be scanned and inventoried using the same process already described.

Once this process is complete, the most complete inventory possible will exist for the automation process.

2.4.2 Automate systems

The next task of the project will include automating all features shown on the sources and developing an electronic version of each system. The steps that will be completed include:

- Georeferencing each plan to base mapping features
- Automating pipe and structure features from source documents
- Attributing features from sources
- Collecting digitized structures not able to be acquired in original field collection
- Hotlinking source documents to automated features
- Developing check plots for Town review
- Editing data per Town comments
- Finalizing the data

This will be done initially for the same pilot area as above and then later for the remainder of the town. At the conclusion of this task both the storm and sanitary sewer systems will be mapped in a GIS format with all source documents and field information linked to the system feature for the pilot area.

2.4.3 Field Location of Stormwater Structures -GPS Survey

Field work will be conducted to identify and/or verify the locations of Stormwater outfalls and structures. Additionally, digital photos will be obtained. The information obtained in the field will be integrated with the GIS system by APPGEO. The key component of the field survey is to identify potential illicit connections to the storm drain system.

Aerial photographs and existing documentation will be used to map a majority of the existing stormwater system. The data collection obtained by GE&A survey crews will supplement mapping prepared by APPGEO. A limited effort for this work (80 hours) has been budgeted for this task. The estimated number of structures to be located by field survey is 350. Identifiers will include: "OUTFALL", "SDMH", and "CB".

2.4.4 Field data collection

GE&A survey crews will determine setup locations for field equipment and identify areas of the town to be mapped. Field crews will wear identification badges and will contact the designated person at the town to identify those areas field crews will be working in the following day. A weekly schedule of anticipated areas to be worked in will be provided each Friday for the following week.

Daily field reports and a copy of all data and field notes obtained, prepared, or generated by the survey crew will be provided to the Project Manager for review on a weekly basis. Work will not proceed the following week until the Project Manager has reviewed the data and verified that the survey has been completed for that specific area. The data will then be transmitted to APPGEO for incorporation into the mapping, allowing for any discrepancies to be identified immediately.

2.5 Sanitary Sewer System Utility Automation Pilot

The sanitary sewer system utility automation pilot will be developed using methods similar to the stormwater utility automation pilot.

2.6 Utility Automation Pilot Deliverables

- Sanitary Sewer System in Geodatabase format on CDROM for 4 to 6 contiguous sheets
- Storm Sewer System in Geodatabase format on CDROM for 4 to 6 contiguous sheets
- Scanned version of all storm and sanitary record drawings (estimated at 26 plans)

2.7 Public Outreach Program related to Stormwater and IDDE Program

Educational Materials targeting the specific illicit discharges identified during the field survey will be prepared by GE&A. These materials are typically developed to be suitable as a mailer insert with water bills, public meeting handouts, or as brochures available at the library, town hall, or other suitable location. Recommendations for distribution will be developed. The following public outreach program will be implemented:

- Preparation of text for a newspaper article on the stormwater program.
- Preparation of text to notify residents that stormwater system inspections will be occurring and field crews will be working throughout the town (newspaper article or billing insert).
- Meeting with department heads on progress of the stormwater program.
- Public meeting on progress of the stormwater program.
- Selectmen meeting on progress of the stormwater program.
- Develop 8 ½ x 11 tri-fold brochure for copying and distribution by the town
- Identify up to five (5) web-links to be included on the town's website
- Recommended implementation program for municipal employees
- Recommended implementation program for general public
- Recommended implementation program for schools
- GE&A will prepare a summary of the Public Education and Outreach program developed for the stormwater program. The town will be responsible for all advertisement, printing, and mailing costs.

2.8 Field Work – Inspection Standard Operating Procedures and Training

GE&A will develop standard operating procedures for inspection of stormwater structures, including manholes, catch basins, and outfalls. Training information including handouts will be provided. Two (2) four hour training sessions will be provided. The training sessions will be videotaped for use by other volunteers.

2.9 Field Data Collection Methods for Inspections

Inspections will provide data on structure type, stormwater system size, construction materials, condition assessment, and suspect illicit connections. The following data will be verified or obtained:

- Structure Type
- Size
- Material
- Condition
- Depth to invert
- Incoming pipes
- Observable Flow
- Signs of Illicit Connections

Field crews will utilize handheld PCs or tablet PCs to obtain data in the field. The data collection format will be reviewed with the town prior to implementation. Development of the field based applications to be used is described in section 3.5.9.

2.10 Outfall Inspections

Field inspections of catch basins and storm drain manholes will be undertaken by volunteer groups, and will be coordinated by the Town.
GE&A field crews will inspect accessible stormwater outfalls in town. Inspections will provide data on structure type, stormwater system size, construction materials, condition assessment, and suspect illicit connections. The following data will be verified or obtained:

- Structure Type
- Size
- Material
- Condition
- Depth to invert
- Incoming pipes
- Observable Flow
- Signs of Illicit Connections

An unknown number of outfalls will be identified as inaccessible. Typical outfalls that are inaccessible include those with covers that are rusted shut, submerged, or on private property. The town will attempt to open these outfalls or make provisions for inspection by GE&A field crews. After the town has completed the process of making outfalls accessible, the town will provide a list of those outfalls that have been made accessible by the town. GE&A will attempt one second visit to a outfall in order to perform an inspection after receiving notification by the Town that outfalls have been made ready by the town for inspection. Those outfalls that are not accessible during the time of second visits will not be inspected and will be listed as inaccessible/not inspected in the inventory.

2.11 Identify Potential Sources of Illicit Discharges

The stormwater system map developed as part of this project in conjunction with existing information will provide a preliminary indication of the potential sources of illicit discharges. Commercial/industrial areas and areas with problematic onsite wastewater disposal systems are typically priority areas. GE&A will meet with the town departments to obtain input on potential sources. A report summarizing potential sources of illicit discharges will be prepared. The report will contain the following:

- Map of the Town showing receiving bodies of water
- Major drainage basin locations based on MassGIS
- Description of illicit connections, e.g., failing septic systems, contaminated groundwater, floor drains, etc.
- Zoning information
- Remote areas susceptible to potential illegal dumping
- Five (5) copies of a summary report on potential sources illicit discharges will be provided. The finding of the report will be discussed at a meeting with town official. A Public Meeting will be held to present the report. Under this task, GE&A will prepare for and attend two (2) meetings to discuss the final report.

2.12 Plan to Follow Up On Dry Weather Flows

Recommendations for further follow-up to investigate sources of dry weather flows and estimated costs will be developed by GE&A. This plan will be used as part of the project and will serve as a document for the town to use when dry weather flows are identified in future inspections. The plan will include the following:

- Inspection and documentation procedures
- Sampling and analysis procedures to verify if dry weather flow is contaminated
- Identify procedures to be followed and estimated costs to pinpoint illicit discharges. Procedures include:

    1. Notifications
    2. Additional manhole and up the pipe storm drain inspections
    3. Dye testing
    4. Video inspection
    5. Smoke testing

- Recommendations for an ongoing illicit discharge identification program, including inspection and sampling and monitoring will be prepared.
- A summary of identified illicit discharges, the specific tasks for recommended follow-up, and estimated implementation costs will be determined.

Five (5) copies of a summary report on following up on illicit discharges will be provided. The finding of the report will be discussed at a meeting with town official. A Public Meeting will be held to present the report. Under this task, GE&A will prepare for and attend two (2) meetings to discuss the final report.

2.13 Fecal Coliform Sampling and Analysis

An allowance of $1,000 is included for fecal coliform analysis of observed dry weather flows at outfalls.

Total Cost Phase 2: $189,570.

PHASE 3

3 Project Area Expansion 1

The next phase of the project will consist of expanding the project area for approximately 50% of the town. The same process that has been described above for the pilot project will be followed for approximately 50% or 50 mapping tiles of the town. It is our intention to use Route 146 as a natural break to divide the town into approximately equal parts. All project components including planimetric mapping, digital orthophotos, parcels, and utility automation will be completed for this area.

3.1 Base Mapping

Continuation of mapping as outlined in section 2.3.

- Planimetric Mapping for region east of Route 126
- Paper check plots for comments; electronic data on CD-ROM
- Digital Orthophotography for region east of Route 126
- MrSID ½ foot resolution digital orthophoto files on CD-ROM

3.2 Stormwater System Mapping

Continuation of mapping as outlined in section 2.4.

- Storm Sewer System in Geodatabase format on CDROM for region east of Route 126

3.3 Sanitary Sewer System Mapping

Continuation of mapping as outlined in section 2.5.

- Sanitary Sewer System in Geodatabase format on CDROM for region east of Route 126

3.4 Outfall Inspections

Continuation of inspection program as outlined in section 2.9.

3.5 Application Development Application Development

3.5.1 Property Viewer Intranet Site

An intranet-based application for viewing and interacting with property maps and CAMA database information through a web browser will be developed. This application will be

available to Town staff through the Town's intranet. This application will also provide an easy way for all Town staff to use GIS & mapping resources without the need for installation of software or for costly training.

3.5.2 Welcome and Search Screen

This will be the opening page for the system, which includes the search capabilities. We will create a user interface that will allow users of the system to search properties based on any of the following criteria:

- Owner's Name
- Parcel Identification Number
- Street Name / Address

For any of the searches, the user simply needs to enter a portion of the name, street, parcel ID, etc. The user can then search on that portion of the field and the system will return a list of closest matches. The user can then select the record of interest from the list of closest matches.

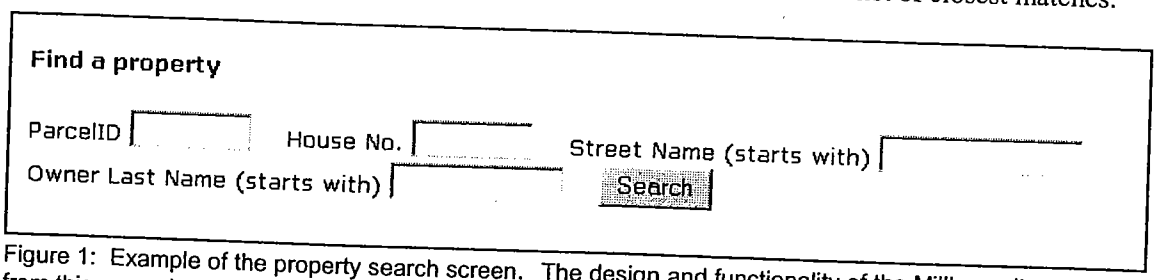

Figure 1: Example of the property search screen. The design and functionality of the Millbury site may vary from this example.

3.5.3 Application Help and Navigation

All pages in the system will contain a set of buttons or "footer links" that will be available throughout the system and in a standard placement on the screen. These buttons would be the key means by which users could navigate and get help on the system.

- **Home/New Search** There will be two basic links to bring the user to the initial property search screen, as well as to the Millbury Town "homepage".
- **Help** Will provide access to documents that describe how to use the web-site functions.
- **About** General description of the system and purpose.
- **Disclaimer** Disclaimer on the use of the system and any known inaccuracies

3.5.4 Property Viewer

The Property Viewer will provide a quick view of the selected parcel and associated attribute information from the CAMA database.

As part of the Property Viewer, a set of predefined maps will be available for viewing and printing. During the Design Review process the Town will need to make several decisions regarding the content of the predefined map theme groups published on the website. Some examples of predefined maps that the Town may want to consider are Zoning, Wetlands, Aerial Photography, Planimetric basemap, or Landuse. The Town is not limited to these categories and may wish to choose different themes for these predefined maps. The Town will provide all layers

to be displayed in the thematic maps as well as a preferred color scheme for each map. The layers must have all necessary attributes for display. This contract covers up to five (4) distinct thematic maps as part of this project.

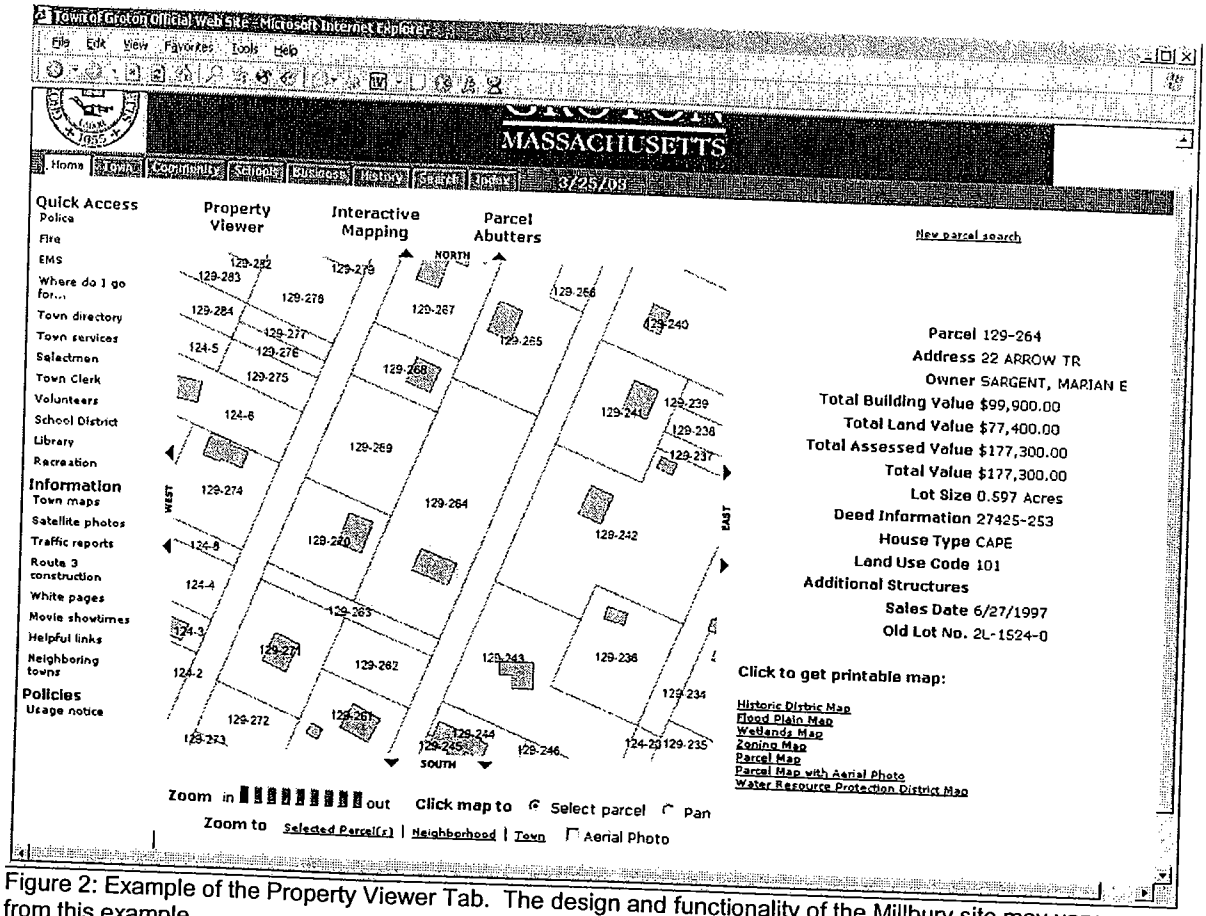

Figure 2: Example of the Property Viewer Tab. The design and functionality of the Millbury site may vary from this example.

3.5.5 Parcel Abutters Tab

The Parcel Abutters Tab will allow the user to create an abutter's list by selecting a radius distance from a drop-down menu. Once abutters are identified, the user will have the option of interactively adding or subtracting parcels that were included/excluded by the automated radius. Once all abutters are identified, users will then have the option of:

- printing a map displaying the abutting properties
- creating a list of abutting properties
- printing pre-formatted mailing labels in PDF format
- opening a list in a new window which can then be copied and pasted into an excel worksheet

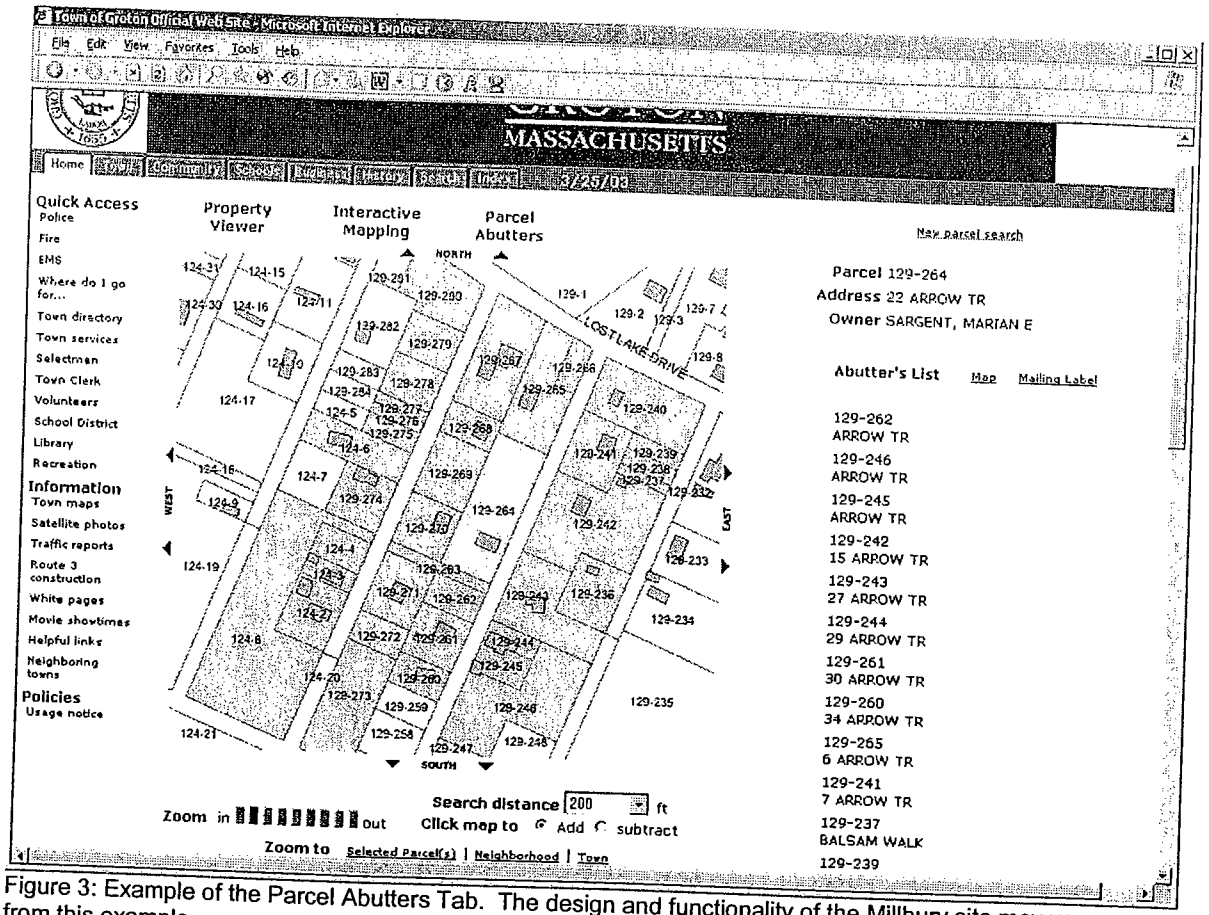

Figure 3: Example of the Parcel Abutters Tab. The design and functionality of the Millbury site may vary from this example.

3.5.6 Interactive Mapping

The Interactive Mapping tab provides Parcel search/select by Parcel-ID, Street Name, House Number or Owner last name or the ability to have NO parcel selected. It will display minimum CAMA information to identify selected parcel (Parcel-ID, Address, Owner). It will allow the user to turn on/off GIS data layers individually or by thematic groups. Basic map navigation tools will be provided: Zoom In/Out, Quick zoom to parcel/block/Town, select new parcel interactively and pan. Once the user has created the map composition they desire, they will be able to print it to 8.5x11 and 11x17 sized hard copies.

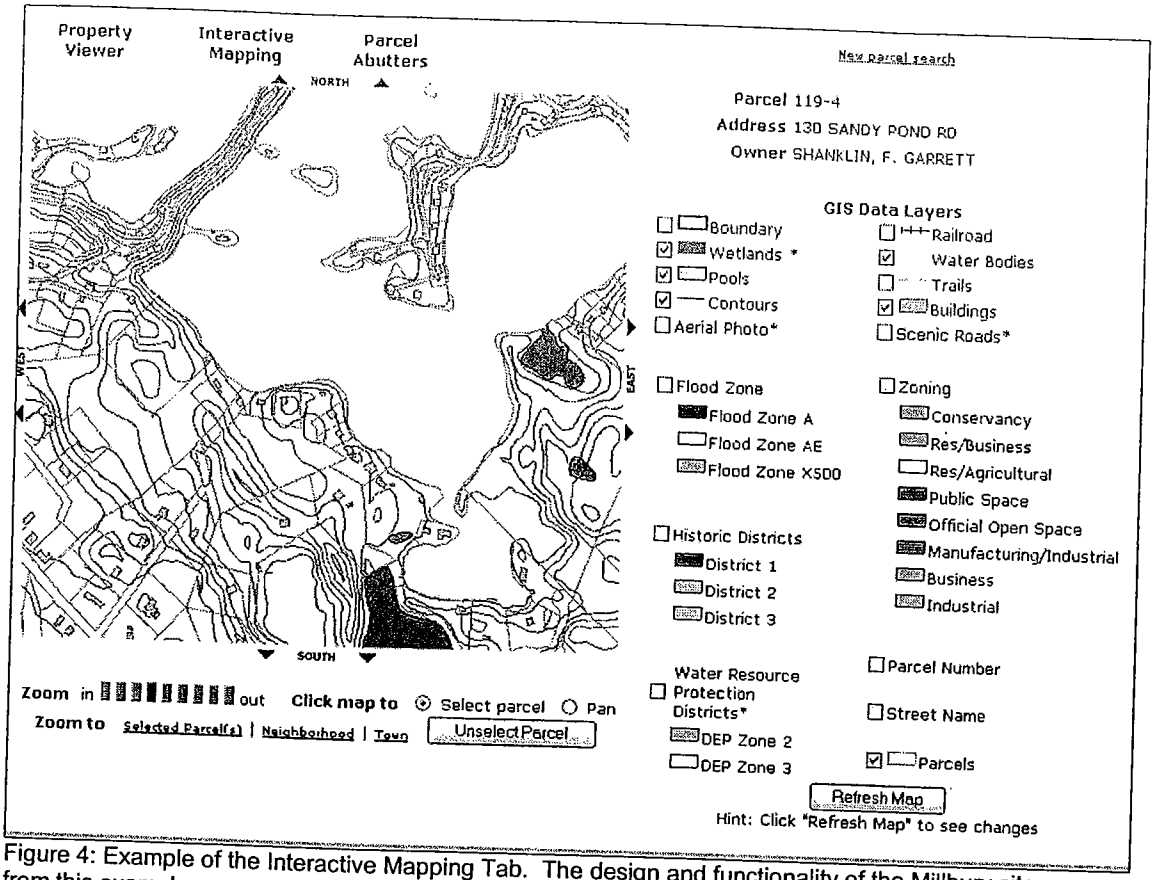

Figure 4: Example of the Interactive Mapping Tab. The design and functionality of the Millbury site may vary from this example.

3.5.7 Utility Data Viewer

The Utility Viewer will provide a quick view of the selected parcel and associated utility information. The utility layers can be turned on and off interactively, while some predefined planimetric layers are always shown in the background. As with the Basic Interactive Mapping Tab, map navigation tools will be provided: Zoom In/Out, Quick zoom to parcel/block/Town, select new parcel interactively and pan. Once the user has created the map composition they desire, they will be able to print it to 8.5x11 and 11x17 sized hard copies.

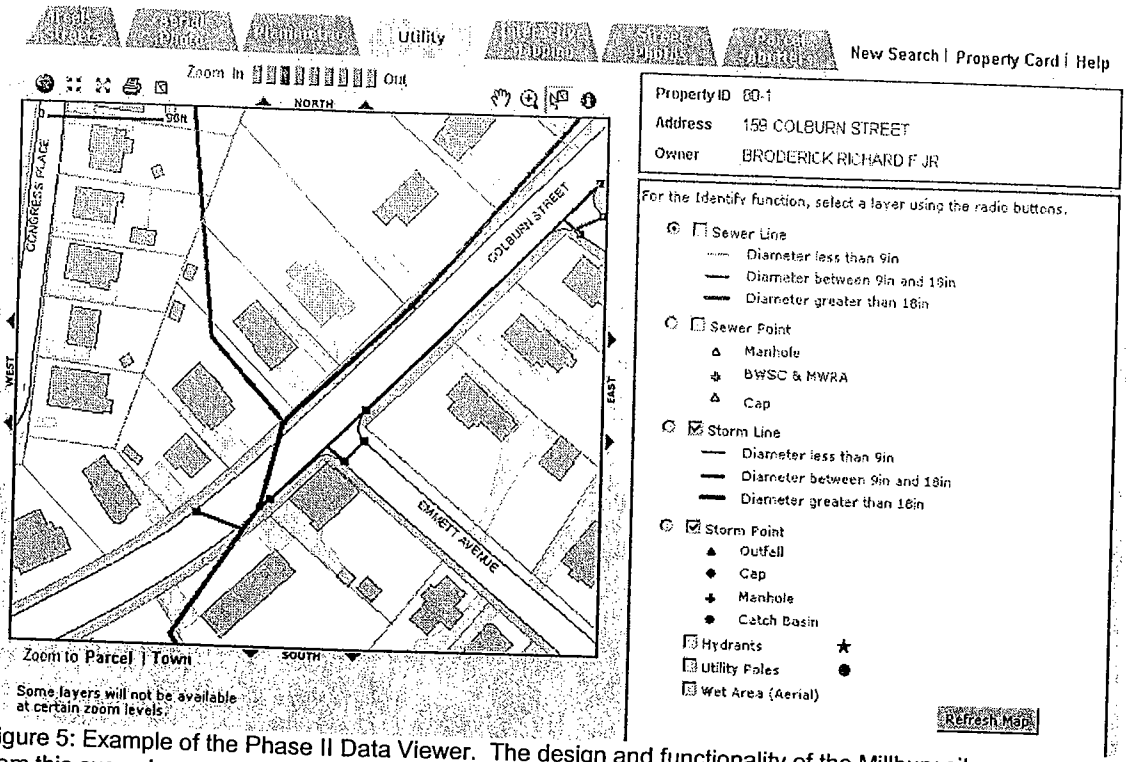

Figure 5: Example of the Phase II Data Viewer. The design and functionality of the Millbury site may vary from this example.

3.5.8 Application Hosting

Once Beta testing is complete, we will make the application available on our web server as an HTTP service. Millbury will be free to advertise the new mapping capability to users within Town Hall. Under this contract, We will host this application on our web server for a period of 12 months following the first 3 months of hosting which is included in the development cost. As indicated below, we will provide this hosting service at the cost of $250/month. If after 12 months the Town wishes to continue having us host the website, this will be provided under a separate contract.

If after the one-year period the Town desires to transfer hosting to a Town server, we will install the required data and Internet Map Server software on a web server at the Town. We will provide all source code and the code will be internally documented. This installation is not included as part of this contract but can be provided through the separate "GIS Implementation Assistance" contract. Successful installation will require that we spend one-day on-site in Millbury to provide an overview of the system architecture, as well as a tutorial on making edits to both client-side and server-side code. We will retain rights to reuse and adapt source code for other similar projects.

3.5.9 Custom Interface for Field Computers

We will provide a custom field-based application, using ESRI's development tools, to provide easy access to data in the field. This application will allow town staff to locate and identify system components, and then have access to more detailed information about each of these components. The functionality provided in this application will include:

- Search by street intersection or parcel
- Feature selection
- Breakpoint placement
- Network analysis/value display
- Generation of adjacent/affected customer list

This application will also include the functionality described in the trace tool section to follow.

3.5.10 Tracing tool

A custom tracing application will be provided that uses ESRI's development tools to enhance the default tracing capabilities provided within ESRI's ArcGIS. This will allow the town to determine where the flow of water that enters a structure discharges (a downstream trace) or perform an upstream trace (determine all of the contributing pipes to the subsystem that discharge at a location by selecting the outfall location). Functionality will be provided in this application will include:

- Search by street intersection or parcel
- Feature selection
- Upstream/downstream trace analysis display
- Generation of adjacent/affected owner list

3.5.11 Application Development Deliverables

- Web Based Property Viewer Intranet Site as described above
- Hosting of Web Site for 12 months after delivery
- Custom Interface for Field Computers as described Above
- Two ESRI/Compaq IPAQ/ArcPad Bundles
- Desktop Tracing Application as described above

3.5.12 Software Solution On-Site Training

We will provide two, four-hour on-site training sessions for up to four users. These training sessions will be for the purpose of familiarizing staff with the functionality of the custom interfaces for field computers developed and provided by us. By having this application the Town will now be able to select an outfall or location where there is an illicit discharge, have the system identify the contributing network to the point, and then have the system return a list of all properties that are adjacent to the collection system.

3.6 Develop Program for Removing Illicit Discharges

A program for removing illicit discharges will be prepared by GE&A. The program for removing illicit discharges will discuss the following:

- Legal authority

- Administrative requirements and record keeping
- Implementation of removal program
- Verification of removal and documentation of results
- Inspection and monitoring following removal of illicit discharge

3.7 Fecal Coliform Sampling and Analysis

An allowance of $1,000 is included for fecal coliform analysis of observed dry weather flows at outfalls.

Total Cost Phase 3: $183,935.

4 PHASE 4

Project Area Expansion 2

The next phase of the project will consist of expanding the project area for the remainder of the town. The same process that has been described above for the pilot project, and the first 50% of the town will be followed for the remaining 50% or 50 mapping tiles of the town. All project components including planimetric mapping, digital orthophotos, parcels, and utility automation will be completed for this area.

4.1 Base Mapping

Continuation of mapping as outlined in section 2.3.

- Planimetric Mapping for region west of Route 126
- Paper check plots for comments; electronic data on CD-ROM
- Digital Orthophotography for region east of Route 126
- MrSID ½ foot resolution digital orthophoto files on CD-ROM

4.2 Stormwater System Mapping

Continuation of mapping as outlined in section 2.4.

Storm Sewer System in Geodatabase format on CDROM for region west of Route 126

4.3 Sanitary Sewer System Mapping

Continuation of mapping as outlined in section 2.5.

Sanitary Sewer System in Geodatabase format on CDROM for region west of Route 126

4.4 Outfall Inspections

Continuation of inspection program as outlined in section 2.9.

4.5 Illicit Discharge and BMP Bylaws

Existing regulations and bylaws will require stormwater provisions. GE&A will assist the town in implementing revisions to town regulations.

- A review of existing subdivision, Board of Health, and Conservation Commission regulations will be conducted.
- Proposed revisions to existing regulations or by-laws will be recommended.
- Options for the installation of BMPs, low impact development (LID), and post construction operation and maintenance requirements will be identified.
- Recommendations for implementation, including staffing and financial considerations will be developed.

A summary of recommendations will be prepared. The proposed regulations will be presented and discussed with the Highway Department, Planning, Board, Town Counsel, Selectmen, and Conservation Commission at a review meeting. GE&A will prepare for and attend the review meeting. GE&A will prepare for and attend a public meeting on the proposed regulations.

4.6 GIS Implementation Assistance - Technical Support

We will provide GIS Assistance consulting services to the Town of Millbury to support the Town's ongoing GIS needs. These services will be provided in one of two general forms, at the discretion of the Town:

A) Services, typically for smaller scale activities, will be provided on ***a time and materials basis*** using the billing rates listed under the fee section of this statement of work.

B) The town will provide ***task-based assignments***, in writing, for which we will submit a fixed price for completion. Our fixed price will be based on personnel hour estimates. Upon mutual agreement of the fee, we will provide the service for the fixed price.

We will work with the Town to perform ongoing services in support of the Town's comprehensive GIS implementation. The Town will specify distinct tasks. These tasks may include, but are not limited to:

- On-site and remote technical assistance and ongoing, customized training and problem solving
- GIS equipment purchase specification, procurement assistance and installation
- Ad hoc data development/maintenance tasks
- Ad hoc map making tasks
- Ad hoc application programming
- Ad hoc assistance in GIS related network management issues
- Integration of external databases with GIS

- Assistance in methodological development of data maintenance policies and procedures
- Assistance in specifying GIS staff roles
- Assistance in specifying and developing applications and system customization, including evaluations of commercially available GIS application software (e.g. infrastructure management, crime analysis, etc.)
- GIS/MIS equipment purchase specification, procurement assistance and installation
- Attendance at GIS planning/coordination meetings

4.7 ESRI Certified Training

We will provide the two-day "Introduction to ArcGIS I" ESRI-Authorized course on-site at a Millbury facility for up to 5 municipal staff members. The following is a course overview provided by ESRI:

> "This two-day course introduces participants to ArcGIS™ and provides the foundation for becoming a successful ArcView®, ArcEditor™, or ArcInfo™ user. Participants learn how to use ArcMap™, ArcCatalog™, and ArcToolbox™ and explore how these applications work together to provide a complete GIS software solution. The course covers fundamental GIS concepts as well as how to create, edit, and work with georeferenced spatial data. Participants learn how to manipulate tabular data, query a GIS database, and present data clearly and efficiently using maps and charts."

This course includes the official course lecture and exercise books, as well as sample course data and 60-day evaluation copies of ArcView 8.3. A full course description is available at: http://gis.esri.com/training/outline.cfm?courseid=808

The course requires a facility that includes at least one Windows NT, 2000 or XP PC per every two users taking the course. Recommended sites would include school computer labs.

4.7.1 Advanced Custom Training

In addition to the ESRI sanctioned 2 day training, we will also develop a subsequent one (1) day training course for more specific or advanced tasks that Town staff wants to perform. With Town input, we will design a custom curriculum and teach a class for up to 5 municipal staff members.

4.7.2 Training Deliverables

- Two day ESRI authorized Instruction class for up to five municipal staff
- One-day custom training class for up to five municipal staff
- One, two hour, training class on use of field based application for up to five people
- One, two hour, training class on use of tracing tool

4.8 Fecal Coliform Sampling and Analysis

An allowance of $1,000 is included for fecal coliform analysis of observed dry weather flows at outfalls.

Total Cost Phase 4: $160,585.

5 Items furnished by the Town of Millbury

The following data and materials to be furnished by the town of Millbury:

1. Access to existing mapping for copying/scanning.
2. Copies of available survey data.
3. A list of town personnel contact information.
4. Identify secure location for setup of GPS equipment.
5. The town will designate in writing one (1) contact person for field crews to communicate with on a daily basis.
6. The field survey crew will be accompanied by authorized town personnel when locating structures in remote areas or areas where drainage structures may not be accessible.
7. The town will make arrangements with residents for entry onto private property and/or easements.